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(21)Application number : 63-044951
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HIROZAWA SATORU

(54) SINTERED PERMANENT MAGNET MATERIAL AND ITS PRODUCTION

(57)Abstract:
PURPOSE: To obtain a permanent magnet having superior magnetic properties by incorporating Cu to a rare-earth sintered permanent magnet containing Fe-B-rare earths as a basic series and also containing Co and subjecting the above magnet to sintering and then to heat treatment under specific conditions.
CONSTITUTION: Powdered raw materials are mixed so that they are formed into a composition consisting of, by atom., 12W17%, in total, of Nd and Pr, 5W14% B, <20% Co, 0.02W0.5% Cu, and the balance Fe, which is pulverized in an inert-gas atmosphere of Ar, etc. The above powdered raw materials are compacted in a magnetic field and the resulting green compact is sintered in a reducing or nonoxidizing atmosphere at 900W1,200° C, and the sintered compact is subjected to heat treatment in vacuum, in an inert-gas atmosphere, or in a reducing atmosphere at 430W600° C for about 5minW40hr. By this method, the sintered permanent magnet having high coercive force, and superior square characteristic in demagnetization curve can be obtained.

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(71)Applicant : SHIN ETSU CHEM CO LTD
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(30)Priority

Priority number : 10355728 Priority date : 15.12.1998 Priority country : JP
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(54) RARE EARTH-IRON-BORON SYSTEM RARE EARTH PERMANENT MAGNET MATERIAL

(57)Abstract:
PROBLEM TO BE SOLVED: To provide an R-Fe-B system rare earth permanent magnet material excellent in both of high coercive force and residual magnetic flux density.
SOLUTION: This material has a compsn. composed of, by weight, 28 to 35% R (R denotes one or ≥ two kinds among rare earth elements selected from Nd, Pr, Dy, Tb and Ho), 0.1 to 3.6% Co, 0.9 to 1.3% B, 0.05 to 1.0% Al, 0.02 to 0.25% Cu, 0.02 to 0.3% Zr and/or Cr, 0.03 to 0.1% C, 0.1 to 0.8% O, 0.002 to 0.02% N, and the balance Fe with inevitable impurities.

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(71)Applicant : SHIN ETSU CHEM CO LTD
(72)Inventor : YAMAMOTO KENJI
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MINOWA TAKEHISA

(30)Priority
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(54) R-Fe-B RARE EARTH PERMANENT MAGNET MATERIAL

(57)Abstract:
PROBLEM TO BE SOLVED: To provide an R-Fe-B rare earth permanent magnet material, in which abnormal grains are grown less, even if an alloy is decreased in oxygen content by separating out ZrB compound, NbB compound, or HfB compound finely and uniformly in a magnet, so as to markedly expand its range of optimal sintering temperature.
SOLUTION: An RFeB magnet alloy is composed of 87.5 to 97.5 vol.% Fe14R2B1 phase (wherein, R denotes at least a kid of rare earth element) and 0.1 to 3 vol.% rare earth or rare earth and oxide of transition metal. A compound selected out of a ZrB compound composed of Zr and B, an NbB compound composed of Nb and B, or an HfB compound composed of Hf and B as main components is contained in the metallic structure of the above alloy, and the compound grains are smaller than 5 μm in average grain diameter and dispersed in the alloy at a maximum interval of 50 μm or smaller.

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